Project 1 Report

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1. Project Environment:
   I am using Java in this project. Here are the lists of libraries below. They are for creating button, image, color, FileDialog, listeners, selecting files and data structure arraylist.

```
import java.awt.Button;
import java.awt.Color;
import java.awt.Component;
import java.awt.FileDialog;
import java.awt.event.WindowAdapter;
import java.awt.event.WindowEvent;
import java.awt.image.BufferedImage;
import java.io.IOException;
import java.io.PrintStream;
import java.nio.file.Files;
import java.nio.file.Paths;
import java.util.ArrayList;
import java.util.List;
import javax.swing.ImageIcon;
import javax.swing.JFrame;
import javax.swing.JOptionPane;
```

2.

Implement:

I use Decode to ReadAllBytes from the file and save them to the byte array Data. Then we call IFH() to decode the header and know the first position of IFD and make sure it is II or MM. Then we can decode first IFD and return the next IFD address. Since I get everything for the RGB values, I use BufferedImage to set the color value from the color array myColor() in order to present the image.

Greyscale:

I use BufferenImae as the argument of Greyscale function and I set RGB = (0.299 * R + 0.587 * G + 0.114 * B).

Dithered Image:

This part of code is based on programming assignment1. I turn the image to greyscale first. And I set an if-else case, which is for the out of ranged pixel value. If it is over 255, we set it to 255. Otherwise it becomes 0.

Dynamic Range:

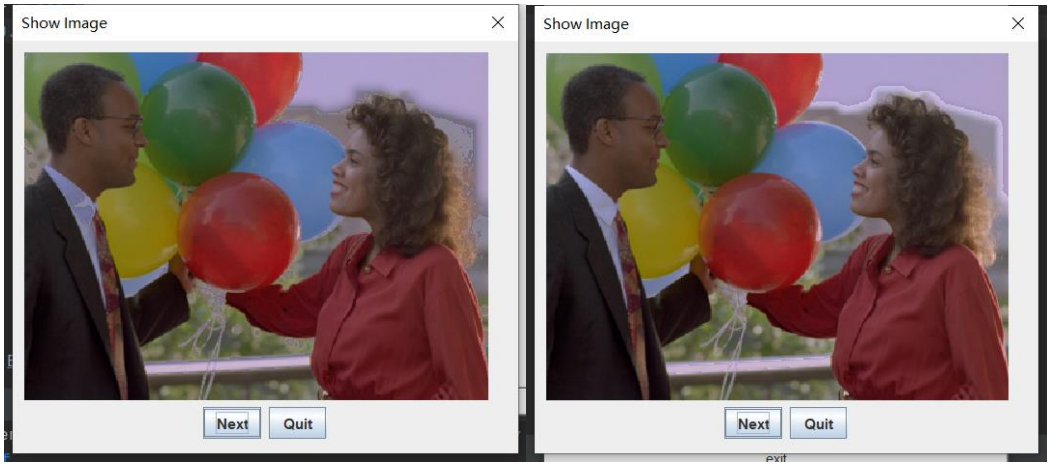
I firstly turn it from RGB to YUV, change the value of Y. After I finish, I turns YUV back to

RGB and return.

3. Dither matrix
   I use dithered matrix {(0,2) , (3,1)}. I learned this dither matrix in class and I use it for both my programming assignment and project.

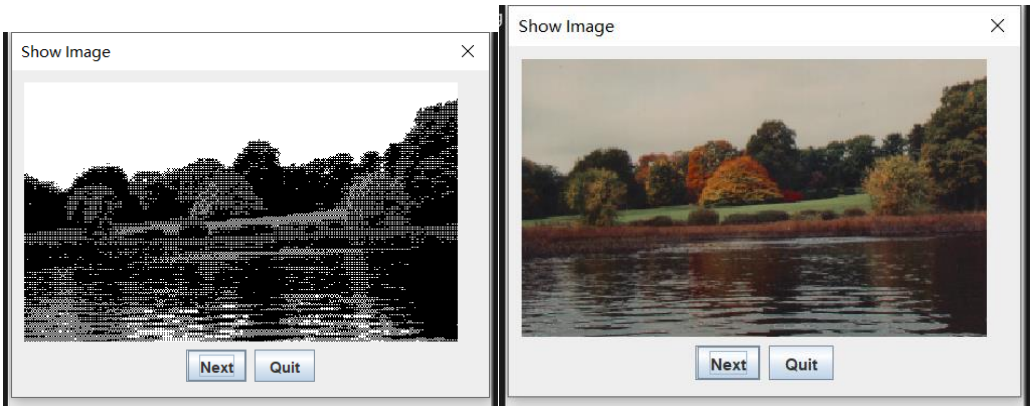
4. Dynamic range adjustment
   I have the case for Y is larger than or smaller than a value, it should be brighter or darker for a ratio. After I test many different cases, I get that if Y is larger or equal than 140, it should be darker with Y*= 0.8. On the other hand, if Y is less or equal than 30, it should be brighter with Y*= 1.2.

   Here is the difference between Y larger and equal to 200 and 140. The one on the left is 200. We can see that the sky behind the woman's head is not that real. So that after I try many different data and I decide to choose 140 to make this data fits all images we test.

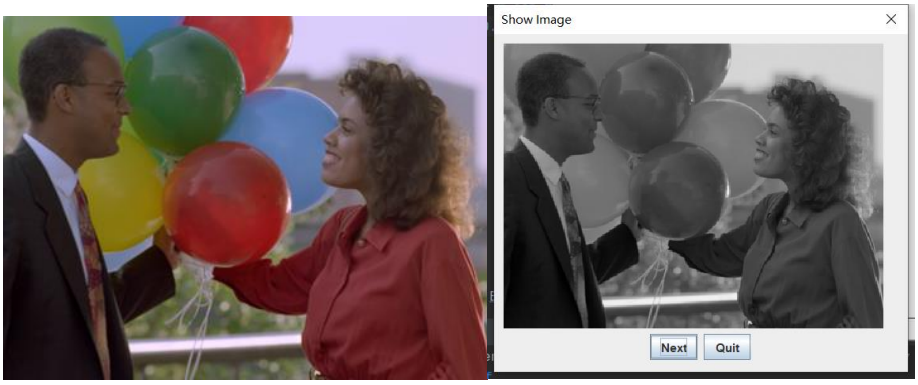


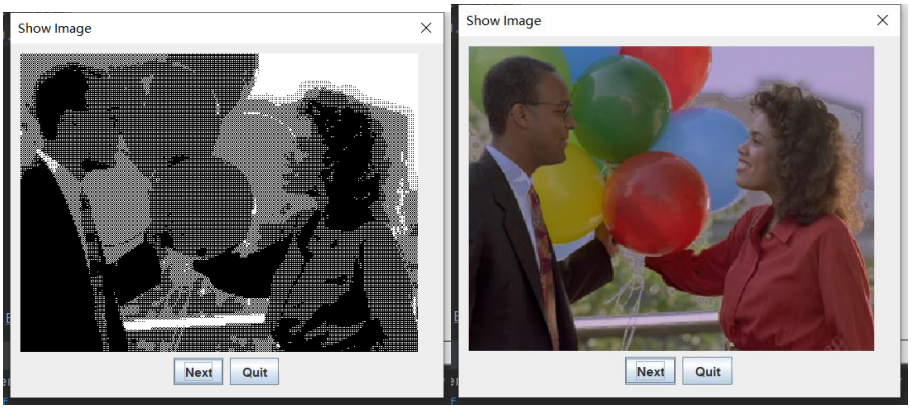
5. Generated images:
   The following order is colored, greyscale, dither, dynamic range.

   Autunm:

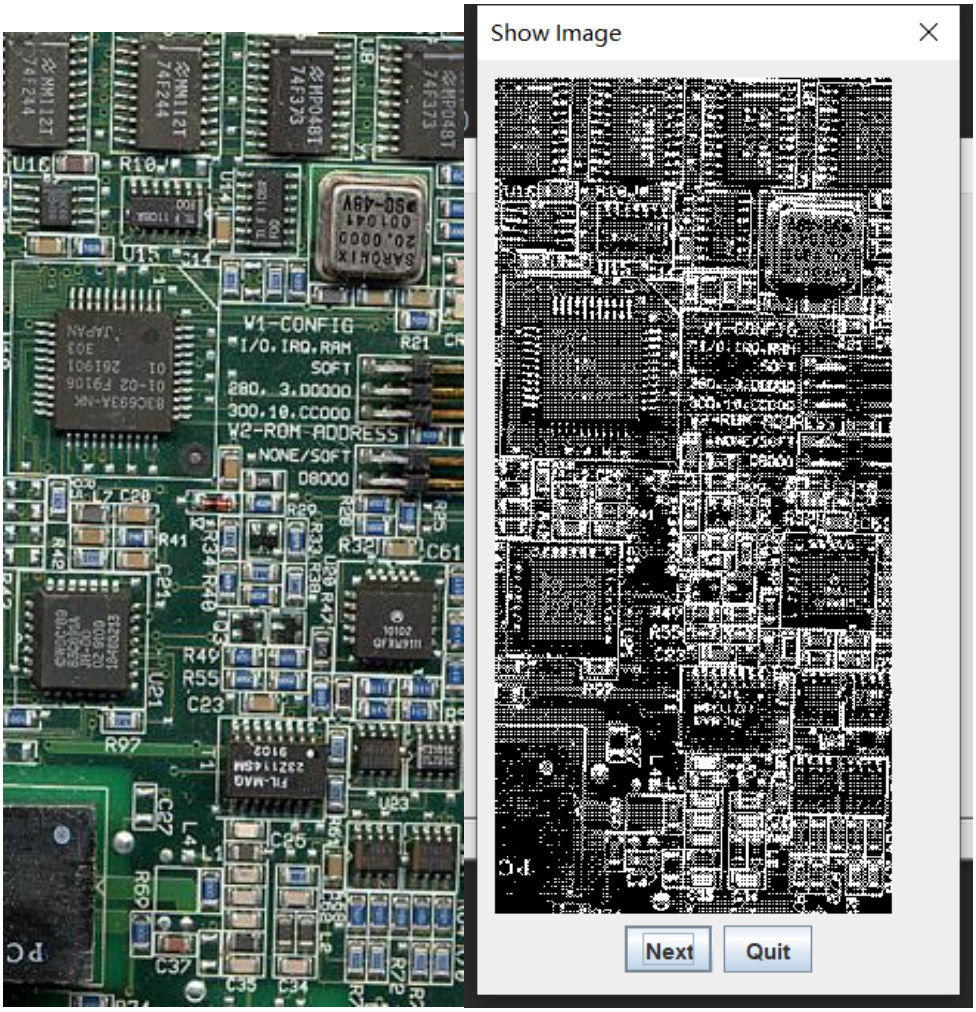


Balloon:





Board: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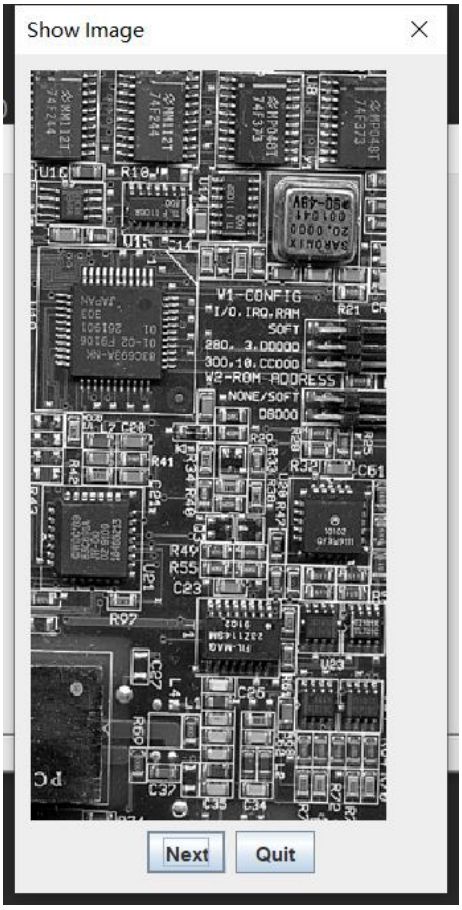
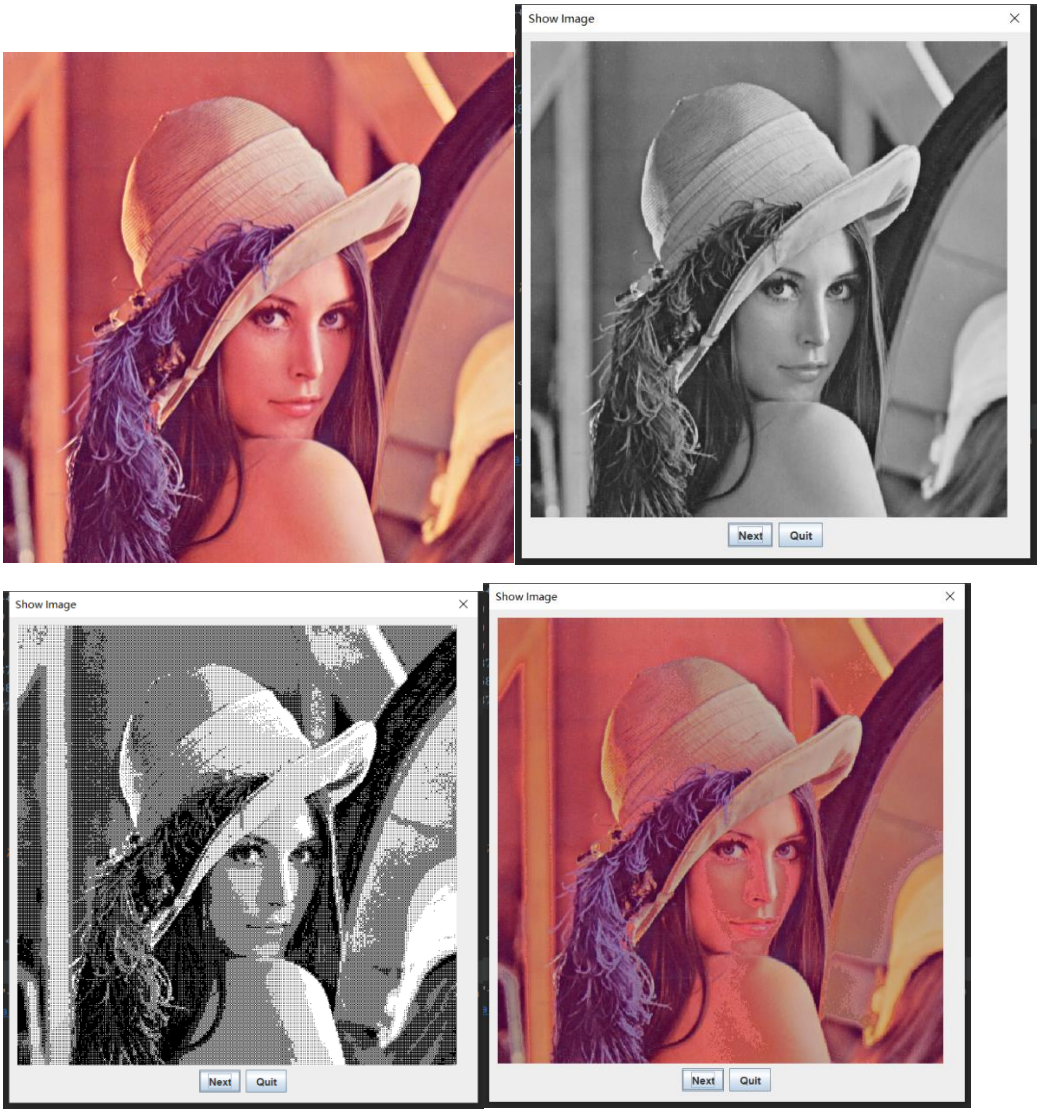
Next
Quit


Show Image
V1-CONFIG
I/O,IRQ,RAM
SOFT
280, 3,DDDDD
300,10,CCDDD
W2-ROM ADDRESS
NONE/SOFT
D8000
Next
Quit

Show Image
V1-CONFIG
I/O,IRQ,RAM
SOFT
280, 3,DDDDD
300,10,CCDDD
W2-ROM ADDRESS
NONE/SOFT
D8000
Next
Quit

Lena: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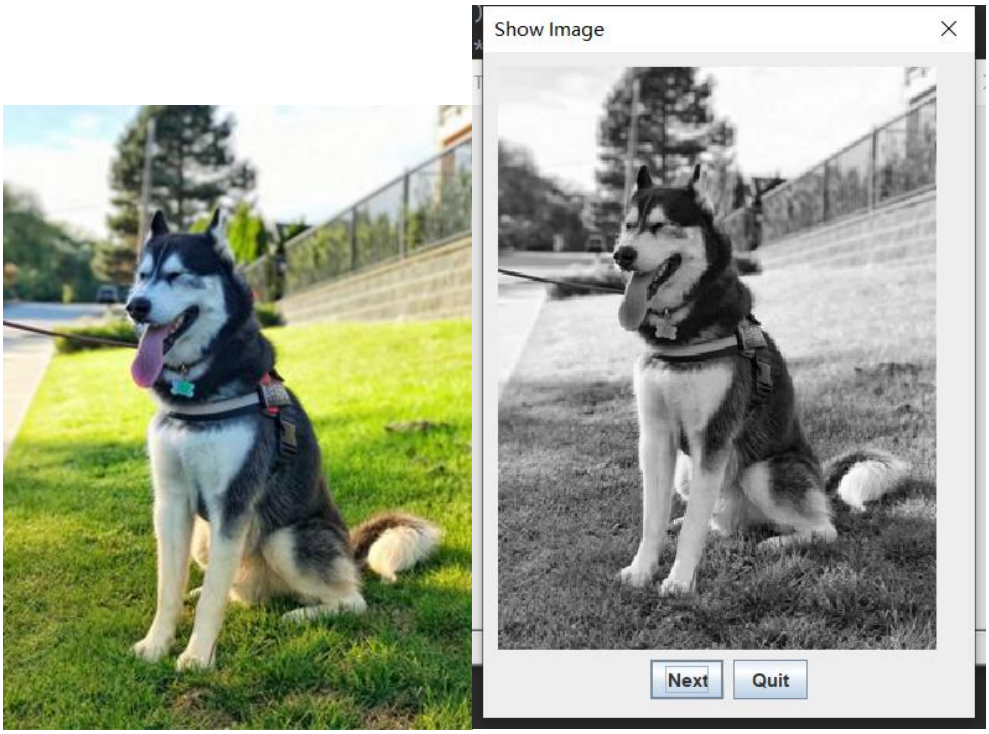
Hudong: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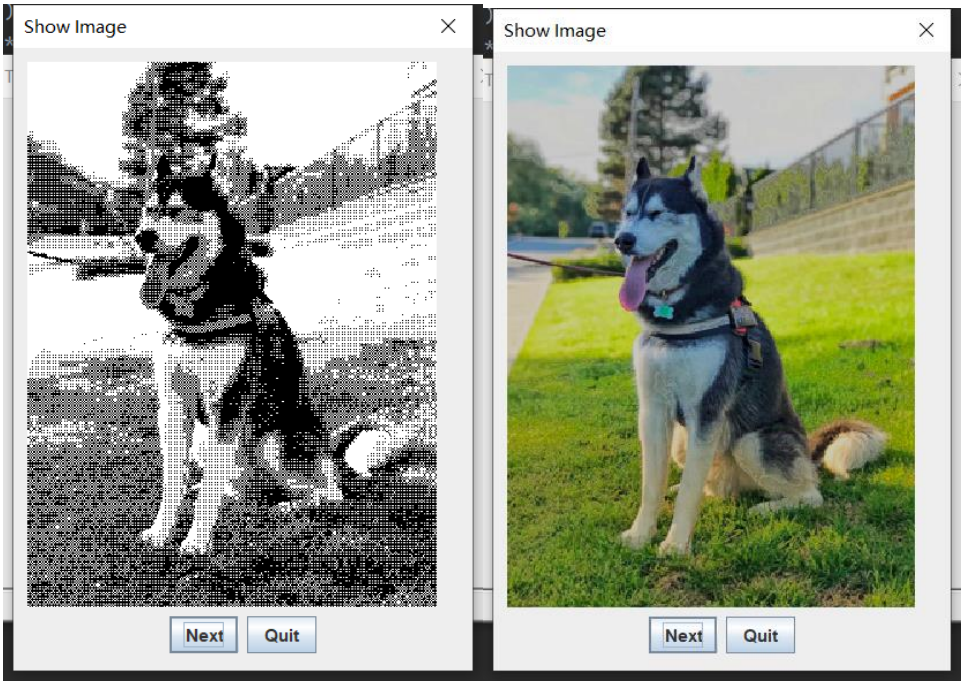
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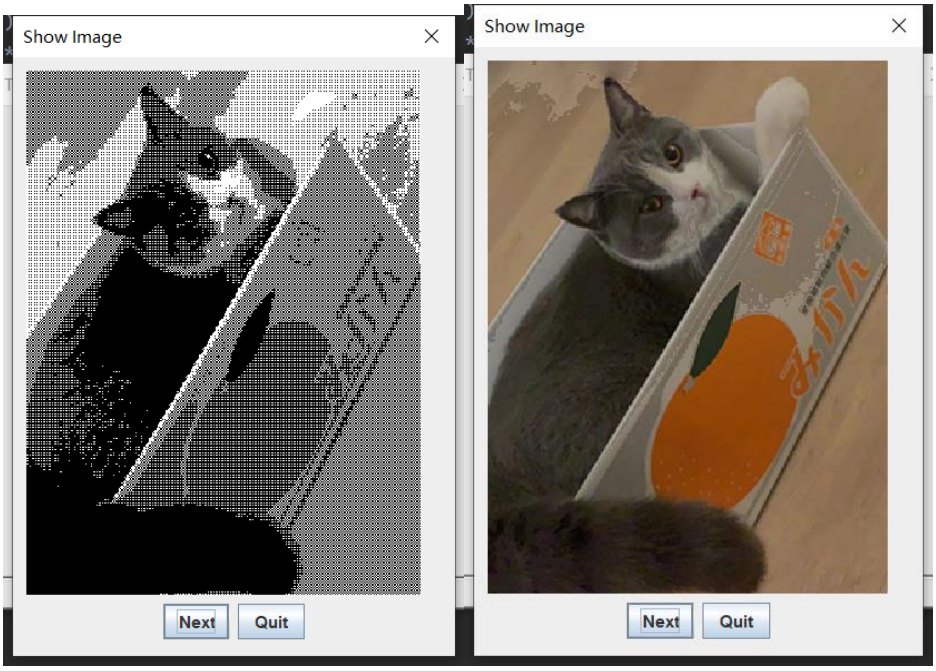
Tuo: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